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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,322	MOGK ET AL.	
	Examiner	Art Unit	
	NATHAN H. BROWN JR	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 February 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3,5 and 8-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1, 3, 5, 8, 9, 10, 11, and 12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 15 January 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office Action is responsive to the communication for application 10/758,322, filed February 26, 2008.

2. Claims 1, 3, 5 and 8-12 are pending. Claims 1, 8, 11, and 12 are currently amended. Claims 2, 4, 6, and 7 are cancelled. Claims 3 and 5 are previously presented. Claims 9 and 10 are original.

3. After the previous office action, claims 1, 3, 5 and 8-12 stood rejected.

4. Examiner withdraws the finality of the previous office action.

Objections to the Claims

5. Claims 1, 8, 11, and 12 are objected to because of the following informalities:

In claim 1: "A method for improving a neural network prediction" should be --A method for making a neural network prediction-- as there is no recited interaction between the convex envelop and the neural network which results in the parameters of the neural network being modified ("improved") where the convex hull and neural network disagree on the classification of an input data record.

In claim 1: "(a) storing training input data records, forming the convex envelope by means of the training input data records" should be --(a) storing training input data records, forming the

convex envelope by computing multiple simplexes using the training input data records-- since that is the critical method recited for training.

In claim 1: "(c) delivering result that" should be --(c) delivering the result that--.

In claim 1: "(d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range" should be --(d) making the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing the input data record by the used neural network if it is inside the working range-- as there is no recited interaction between the convex envelop and the neural network which results in the parameters of the neural network being modified ("improved") where the convex hull and neural network disagree on the classification of an input data record.

In claim 8: "A system for improving a neural network prediction" should be --A system for making a neural network prediction-- as there is no recited interaction between the convex envelop and the neural network which results in the parameters of the neural network being modified ("improved") where the convex hull and neural network disagree on the classification of an input data record.

In claim 8: "(d) improving the neural network prediction" should be --(d) making the neural network prediction-- for the reasons stated above.

In claim 8: "means for improving" should be --means for making-- for the reasons stated above.

In claim 8: “the improving means” should be --the prediction means-- for the reasons stated above.

In claim 11: “A method for improving a neural network prediction" should be --A method for making a neural network prediction-- for the reasons stated above.

In claim 11: “(b) checking whether the input data record is in the convex envelope, in checking whether there is a hyper-plane which contains the input data so that all the training input data records are located on one side of the hyper-plane” should be --(b) checking whether the input data record is in the convex envelope by checking whether there is a hyper-plane of the convex envelope such that all the training input data records are located on the same side of the hyper-plane as the input data record--.

In claim 11: “(d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range.” should be --(d) making the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing the input data record by the used neural network if it is inside the working range--.

In claim 12: “A method for improving a neural network prediction” should be -- A method for making a neural network prediction--.

In claim 12: “(a) storing training input data records for the neural network, forming the convex envelope by means of the training input data records” should be --(a) storing training input data records, forming a convex envelope using the training input data records-- for clarity.

In claim 12: “(d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range” should be --(d) making the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing the input data record by the used neural network if it is inside the working range-- for clarity.

Appropriate correction is required.

Claim Rejections - 35 USC § 112, 1st

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Amended claims 1, 3, 5, and 8-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Amended

independent claims 1, 8, 11, and 12 recite “improving a neural network prediction…based on whether the input data record is in a working range of a neural network”. Paragraph [0016] of the Specification states only that a “neural network is trained using these training data records, that is to say the weightings of the neurons are adapted iteratively". No disclosure of how a training or input data record being inside or outside of a convex envelope (working range of a neural network) leads to the modification of a neural network’s parameters (i.e., weights and biases) necessary for learning (“improvement”). The dependent claims 3, 10, 9, and 5, do not cure the deficiency of the independent claims; therefore claims 1, 3, 5, and 8-12 are rejected under 35 U.S.C. 112, 1st.

Claim Rejections - 35 USC § 112, 2nd

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Amended claims 1, 3, 5, and 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Amended independent claims 1, 8, 11, and 12 recite “improving a neural network prediction…based on whether the input data record is in a working range of a neural network”. However, the Specification states only that a “neural network is trained using these training data records, that is to say the weightings of the neurons are adapted iteratively" (see [0016]). Clearly, the specification does not conclude with one or more claims

particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention as nothing in the disclosure recites how a training or input data record being inside or outside of a convex envelope (working range of a neural network) leads to the modification of a neural network's parameters (i.e., weights and biases) necessary for learning ("improvement"). The dependent claims 3, 10, 9, and 5, do not cure the deficiency of the independent claims; therefore claims 1, 3, 5, and 8-12 are rejected under 35 U.S.C. 112, 2nd.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 8, 9, 10, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Zakrzewski* (USPN: 7,203,716) in view of *Budinich et al.* (*Budinich*), "Feed-forward neural networks: a geometrical perspective", 1991.

Regarding claim 1. (Currently amended) *Zakrzewski* teaches a method for improving a neural network prediction (*see* Abstract, *Examiner interprets "training and verifying neural networks" to be methods for improving a neural network prediction.*) for an input data record being

manufacturing process data selected from the group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature data (*see* col. 1, lines 20-21, *Examiner interprets the experimental data that may be used to model physical or engineering systems to include manufacturing process data selected from the group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature.*); comprising the following steps:

(a) storing training input data records for the neural network, forming the convex envelope by means of the training input data records (*see* col. 13, lines 52-60),

(b) checking whether the input data record is in the convex envelope (*see* col. 5, lines 20-37, Examiner asserts that if the linear combination of the vertices of the simplex used to express the point **x** (the input data) interior to the simplex is convex, such that all coefficients are positive and summing to less than 1, then there is at least one hyper-plane which contains the input data record so that all the training input data records are located on one side of the hyper-plane.), in

(i) selecting a number (d + 1) of non-collinear points from the set of training input records (*see* col. 5, lines 22-29, Examiner interprets n to be the number of dimensions of the data space and K to equal 1 since the "particular value for K used may vary in accordance with the particular considerations of each embodiment".),

(ii) forming a first simplex (S1) from the selected points (*see* col. 5, lines 29-31),

(iii) selecting a point (xl) from the interior of the first simplex (Sl) (*see* col. 5, lines 29-31),

(iv) defining a path between the input data record and the selected point (*see* col. 6, lines 20-25, *Examiner interprets the shifted vertices v(n+1) to form a path between the input data record and the selected point.*),

(v) checking whether there is an intersection point (xl+l) between the path and a facet of the first simplex (*see* col. 6, lines 35-46, *Examiner interprets the convex linear combination of n vertices having the origin translated to the remaining n+1th vertex to express an intersection point.*), and

(vi) checking whether a second simplex (Sl+l) which contains the intersection point and a section of the path can be formed from the number of points from the training input data records (*see* col. 6, lines 52-56, *Examiner interprets "the next simplex" to be a second simplex.*),

(c) delivering result that input data record is inside or outside the working range of the neural network through confirming that the input data is respectively inside or outside the convex envelope (*see* col. 7, lines 1-33, *Examiner interprets the evaluation of the fitted linear function at point x(hat) to comprise delivering result that input data record is inside the working range of the neural network through confirming that the input data is respectively inside or outside the convex envelope.*).

Zakrzewski does not teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network and (d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the

used neural network and processing by the used neural network the input data record if it is inside the working range. However, *Budinich* does teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network (*see* p. 884, Corollary para. 2, "Since the convex hull is also the intersection of the half-spaces determined by its supporting hyperplanes, we see immediately how to build a feed-forward neural network with the property of selecting all and only the given examples…", *Examiner interprets a feed-forward neural network built from association with a "convex hull" to be a neural network whose prediction (mapping some input to some output) is based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network* .). *Budinich* also teaches (d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range (*see* p. 884, Corollary para. 1, *Examiner interprets cutting off extreme points of a convex hull "yielding another, 'smaller', convex set" to be improving the neural network prediction by disregarding the input data record if it is outside the working range since the neural network is constructed from the smallest convex set of a series of cuttings.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Zakrzewski* with *Budinich* to apply some theorems of n-dimensional geometry to digital feed-forward neural networks and use the construction of the convex hull as an alternative to more traditional learning algorithms.

Regarding claim 8. (Examiner amended) *Zakrzewski* teaches a system (*see* Fig. 3 and col. 12, line 42 to col. 13, line 51) for improving a neural network prediction (*see* Abstract, *Examiner interprets "training and verifying neural networks" to be methods for improving a neural network prediction.*) for an input data record being manufacturing process data selected from the group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature data (*see* col. 1, lines 20-21, *Examiner interprets the experimental data that may be used to model physical or engineering systems to include manufacturing process data selected from the group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature.*); comprising

at least one neural network which has been trained using a set of training input data records (*see* col. 13, lines 52-55);

means for improving the neural network prediction by checking the input data record relative to the convex envelope which is formed by the training input data records (*see* col. 5, lines 20-37, Examiner asserts that if the linear combination of the vertices of the simplex used to express the point **x** (the input data) interior to the simplex is convex, such that all coefficients are positive and summing to less than 1, then there is at least one hyper-plane which contains the input data record so that all the training input data records are located on one side of the hyper-plane.);

a hybrid model which contains at least a first neural network and a second neural network, the first neural network having been trained using a set of first training input data

records, and the second neural network having been trained using a set of second training input data records, the improving means being embodied in such a way that for a first input data record for the first neural network it is checked whether the first input data record is in the convex envelope which is formed by the first training input data records, and that it is checked for a second input data record for the second neural network whether the second input data record is in the convex envelope which is formed by the second training input data records, the assignment of the first input data record to the first neural network and the assignment of the second input data record to the second neural network being carried out in automated fashion from a composite data record (*Examiner asserts that this "hybrid model" is simply two neural networks performing the method of claim 1.*).

Zakrzewski does not teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network and (d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range. *Budinich* does teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network (*see* p. 884, Corollary para. 2, "Since the convex hull is also the intersection of the half-spaces determined by its supporting hyperplanes, we see immediately how to build a feed-forward neural network with the property of selecting all and only the given examples…", *Examiner interprets a feed-forward*

neural network built from association with a "convex hull" to be a neural network whose prediction (mapping some input to some output) is based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network .). *Budinich* also teaches disregarding the input data record if it is outside the convex envelope and processing by the used neural network the input data record if it is inside the convex envelope (*see* p. 884, Corollary para. 1, *Examiner interprets cutting off extreme points of a convex hull "yielding another, 'smaller', convex set" to be improving the neural network prediction by disregarding the input data record if it is outside the working range since the neural network is constructed from the smallest convex set of a series of cuttings.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Zakrzewski* with *Budinich* to apply some theorems of n-dimensional geometry to digital feed-forward neural networks and use the construction of the convex hull as an alternative to more traditional learning algorithms.

Regarding claim 9. (Original) *Zakrzewski* teaches the system according to Claim 8 wherein the checking means being embodied in such a way that the checking is carried out in accordance with a method according to Claim 1 (*see* Fig. 3 and col. 12, line 42 to col. 13, line 51, *Examiner interprets the system disclosed in Fig. 3 to be a system according to Claim 8 wherein the checking means being embodied in such a way that the checking is carried out in accordance*

with a method according to Claim 1.).

Regarding claim 10. (Original) *Zakrzewski* teaches computer digital storage medium program product for carrying out a method according to Claim 1 (*see* Fig. 3 and col. 12, line 42 to col. 13, line 51, *Examiner interprets the Data Storage System 52 to be a digital storage medium program product for carrying out a method according to Claim 1.*).

Regarding claim 11. (Currently amended) *Zakrzewski* teaches a method for improving a neural network prediction (*see* Abstract, *Examiner interprets "training and verifying neural networks" to be methods for improving a neural network prediction.*) for an input data record being manufacturing process data selected from the group comprising data related to the materials use, composition data, parameters of the production system, pressure data and/or temperature date (*see* col. 1, lines 20-21, *Examiner interprets the experimental data that may be used to model physical or engineering systems to include manufacturing process data selected from the group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature.*), comprising the following steps:

(a) storing training input data records for the neural network, forming [[a]] the convex envelope by means of the training input data records (*see* col. 13, lines 52-60),

(b) checking whether the input data record is in the convex envelope, in checking whether there is a hyper-plane which contains the input data record so that all the training input data records are located on one side of the hyper-plane (*see* col. 5, lines 20-37, Examiner asserts

that if the linear combination of the vertices of the simplex used to express the point **x** (the input data) interior to the simplex is convex, such that all coefficients are positive and summing to less than 1, then there is at least one hyper-plane which contains the input data record so that all the training input data records are located on one side of the hyper-plane.),

(c) delivering a result that input data record is within or without the working range of used neural network through confirming that the input data is respectively inside or outside the convex envelope (*see* col. 7, lines 1-33, *Examiner interprets the evaluation of the fitted linear function at point x(hat) to comprise delivering result that input data record is inside the working range of the neural network through confirming that the input data is respectively inside or outside the convex envelope.*).

Zakrzewski does not teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network and (d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range. *Budinich* does teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network (*see* p. 884, Corollary para. 2, "Since the convex hull is also the intersection of the half-spaces determined by its supporting hyperplanes, we see immediately how to build a feed-forward neural network with the property of selecting all and only the given examples…", *Examiner interprets a feed-forward*

neural network built from association with a "convex hull" to be a neural network whose prediction (mapping some input to some output) is_based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network .). *Budinich* also teaches <u>(d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working</u> range (*see* p. 884, Corollary para. 1, *Examiner interprets cutting off extreme points of a convex hull "yielding another, 'smaller', convex set" to be improving the neural network prediction by disregarding the input data record if it is outside the working range since the neural network is constructed from the smallest convex set of a series of cuttings.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Zakrzewski* with *Budinich* to apply some theorems of n-dimensional geometry to digital feed-forward neural networks and use the construction of the convex hull as an alternative to more traditional learning algorithms.

Regarding claim 12. (Currently amended) *Zakrzewski* <u>teaches a</u> method for <u>improving a neural network prediction</u> for an input data record <u>being</u> manufacturing_process <u>data selected from the</u>

<u>group comprising data related to the materials used, composition data, parameters of the production system, pressure data and/or temperature data</u>, comprising the following steps:

(a) storing training input data records, forming a convex envelope using the training input data records (*see* col. 13, lines 52-60),

(b) checking whether the input data record is in the convex envelope (*see* col. 5, line 17-37, *Eaminer asserts that steps (i)-(vi) are an obvious variation of steps (i)-(vi) of claim 1 (see above) where the vectors used to construct the interior search set are simply normalized and thus an obvious variation of interpolation technique of Zakrzewski.*), in

(i) selecting an initial vector $\lambda^{(0)} = (\lambda_1,..., \lambda_n)$ with $(\lambda_1 + ... + \lambda_n) = 1$ and $\lambda_j \geq 0$ ($j = 1,...,n$), where preferably $\lambda_j = 1/n$ is selected,

(ii) selecting a matrix M in such a way that the lines matrix $P^{hat(0)} = M*P^{(i)}$ are orthonomal,

(iii) calculating $\lambda = \lambda^{(i)} + P^{hat(i)T} * (x^{hat} - x^{hat(i)})$ where $x^{hat(i)} = P^{hat(i)} * \lambda^{(i)}$,

(iv) checking whether all $\lambda_j \geq 0$ (for $j = 1,...,n$),

(v) deleting all components from the matrix $P^{hat(i)}$ and from the vector $\lambda^{(i)}$, which infringe the secondary condition $\lambda_j \geq 0$ (for $j = 1,...,n$),

(vi) renewing calculating of λ, and

(c) delivering a result that input data record is within or without the working range of the used neural network through confirming that the input data is respectively inside or outside the convex envelope (*see* col. 7, lines 1-33, *Examiner interprets the evaluation of the fitted linear function at point x(hat) to comprise delivering result that input data record is inside the working range of the neural network through confirming that the input data is respectively inside or outside the convex envelope*.

Zakrzewski does not teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network and (d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working range. However, *Budinich* does teach the prediction being based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network (*see* p. 884, Corollary para. 2, "Since the convex hull is also the intersection of the half-spaces determined by its supporting hyperplanes, we see immediately how to build a feed-forward neural network with the property of selecting all and only the given examples…", *Examiner interprets a feed-forward neural network built from association with a "convex hull" to be a neural network whose prediction (mapping some input to some output) is based on whether the input data record is in a working range of a neural network, wherein the working range is defined by a convex envelope formed by training input data records of the neural network* .).

Budinich also teaches <u>(d) improving the neural network prediction by disregarding the input data record if it is outside the working range of the used neural network and processing by the used neural network the input data record if it is inside the working</u> range (*see* p. 884, Corollary para. 1, *Examiner interprets cutting off extreme points of a convex hull "yielding another, 'smaller', convex set" to be improving the neural network prediction by disregarding the input data record if it is outside the working range since the neural network is constructed from the smallest convex set of a series of cuttings.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Zakrzewski* with *Budinich* to apply some theorems of n-dimensional geometry to digital feed-forward neural networks and use the construction of the convex hull as an alternative to more traditional learning algorithms.

Response to Arguments

16. Applicant's arguments filed February 26, 2008 have been fully considered.

<u>Rejection of Claims 1, 3, and 10 Under 35 U.S.C. §112, 1st</u>

Examiner finds Applicants arguments persuasive and withdraw the rejection of claims 1, 3, and 10 under 35 U.S.C. §112, 2nd. Examiner provides new grounds of rejection under 35U.S.C. §112, 1st.

Rejection of Claims 1, 3, 5, and 8-12 Under 35 U.S.C. §112, 2nd

Examiner finds Applicants arguments persuasive and withdraw the rejection of claims 1, 3, 5, and 8-12 under 35 U.S.C. §112, 2nd. Examiner provides new grounds of rejection under 35 U.S.C. §112, 2nd.

Rejection of Claims 1, 3, 5, and 8-12 Under 35 U.S.C. §101

Examiner finds Applicants arguments persuasive and withdraw the rejection of claims 1, 3, 5, and 8-12 under 35 U.S.C. §101.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nathan H. Brown, Jr.
May 6, 2008

/David R Vincent/

Supervisory Patent Examiner, Art Unit 2129